

CLAIMS

What is claimed is:

1. An insert for a mold comprising:  
a plug having an outer axial face;  
a receiver having a cavity therein for receiving the plug; and  
a rotating mechanism that operably cooperates with the plug and the receiver  
to permit the insert to be rotated relative to the mold.
2. The insert of claim 1 further comprising a groove in one of the plug and the receiver and a locator carried by the other of the plug and the receiver wherein the locator is received in the groove to permit the axially outer insert surface to be rotated relative to the mold while preventing the plug from being withdrawn from the receiver.
3. The insert of claim 2 wherein the receiver has a sidewall that defines the cavity and has an interior sidewall surface that communicates with the cavity, and wherein the groove is disposed in the interior sidewall surface and the locator extends outwardly from the plug.
4. The insert of claim 3 wherein the plug comprises a head and a body that is received in the cavity, and wherein the body carries the locator.

5. The insert of claim 3 wherein body comprises a sidewall and the locator comprises a ball that is biased outwardly from the sidewall of the body.
6. The insert of claim 3 wherein the plug has an axial end with a plurality of circumferentially spaced apart notches in the axial end that cooperate with a detent in the cavity to permit the plug to be indexed.
7. The insert of claim 6 wherein the detent comprises a pin that extends radially inwardly into the cavity.
8. The insert of claim 4 wherein the body of the plug has a hollow therein and further comprising a biasing element received in the hollow that biases the locator outwardly from the body of the plug.
9. The insert of claim 8 wherein the hollow in the body of the plug is internally threaded and further comprising an externally threaded retainer threaded into the hollow for retaining the biasing element in the hollow.
10. The insert of claim 9 wherein the biasing element comprises a non-metallic wad.

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11. The insert of claim 10 wherein the wad is comprised of an a rubber or a polymer.

12. The insert of claim 10 wherein the wad is comprised of an elastomer.

13. The insert of claim 3 wherein:

the plug comprises a generally cylindrical sidewall extending axially from the head and which is received in the cavity in the receiver with the sidewall having an axial end with a plurality of spaced apart notches in the axial end, and a bore through the sidewall, and wherein the sidewall defines a hollow in the plug;

a generally cylindrical elastomeric wad received in the hollow and which urges the locator through the bore generally radially outwardly from the sidewall;

a retainer received in the hollow that engages the sidewall and which retains the wad in the hollow;

a pin carried by the receiver that extends radially inwardly into the cavity and which cooperates with at least one of the notches in the axial end of the sidewall of the plug to permit the plug to be indexed relative to the receiver.

14. The insert of claim 13 wherein the receiver comprises a cup that is received in a pocket in a cavity in the mold and the axially outer face of the plug comprises an indicia imprinting surface for imparting an impression in a hardenable material received in the mold cavity.

15. The insert of claim 14 wherein the cup is removable from the pocket in the mold.
16. The insert of claim 15 wherein the cup comprises a bottom wall with a bore therein and further comprising a fastener removably mounting the cup to the mold.
17. The insert of claim 14 wherein the hardenable material comprises plastic.
18. The insert of claim 14 wherein the hardenable material comprises a metal.
19. The insert of claim 13 wherein 1) the mold has a cavity therein for receiving a hardenable material therein from a source of the hardenable material, 2) the receiver is received in a pocket in the mold, 3) the axially outer face of the plug has a channel therein, and 4) wherein the plug i) is rotated to an open position to permit flow of the hardenable material from the source through the channel to the cavity in the mold, and ii) is rotated to a closed position disposed from the open position to impede flow of the hardenable material from the source through the channel and to the cavity in the mold.
20. The insert of claim 13 wherein the receiver and plug are carried by an ejector pin.

21. The insert of claim 20 wherein the ejector pin comprises a generally cylindrical barrel having a head removably secured to one end of the barrel and wherein the cup and plug are disposed at an opposite end of the barrel.
22. The insert of claim 21 further comprising a fastener removably securing the head to the barrel.
23. The insert of claim 21 wherein the head has a threaded bore and the barrel has a threaded portion for threadably securing the head to the barrel.
24. The insert of claim 2 wherein the receiver has a sidewall with an interior sidewall surface that defines the cavity, and wherein a) the locator extends inwardly from the interior sidewall surface and b) the groove is disposed in the plug.
25. The insert of claim 24 wherein the groove has a helical portion and a portion disposed generally transverse to a longitudinal axis of the plug.
26. The insert of claim 25 wherein the groove has only a single one of the helical portion and only a single one of the generally transverse portion.
27. The insert of claim 26 wherein the groove extends no more than about one and one-half times around the periphery of the plug.

28. The insert of claim 25 wherein the transverse portion extends at least about 250° around the periphery of the plug.
29. The insert of claim 25 wherein the helical portion is angled acutely relative to the transverse portion.
30. The insert of claim 25 wherein the groove has a depth of at least about 0.020 inches.
31. The insert of claim 30 wherein the groove has a width of at least about 0.040 inches.
32. The insert of claim 26 wherein the groove has a curvilinear cross-sectional contour.
33. The insert of claim 32 wherein the receiver has a bore and the locator further comprises a ball received in the bore and which has a portion that extends outwardly into the cavity and wherein the portion of the ball that extends outwardly into the cavity is received in the groove to permit the plug to rotate relative to the receiver while preventing the plug from moving axially relative to the receiver.

34. The insert of claim 33 wherein the ball is retained in the bore by a plate removably secured to the receiver.

35. The insert of claim 25 wherein

a) the cavity has an enlarged portion, a necked-down portion, an inwardly extending shoulder disposed between the enlarged portion and the necked down portion;

b) the plug comprises a head, a necked-down stem, and a shoulder disposed between the head and stem; and

c) wherein the stem is received in the necked-down portion of the cavity, the head is received in the enlarged portion of the cavity, and the shoulder of the plug is disposed adjacent the shoulder of the cavity when the plug is received in the cavity.

36. The insert of claim 35 wherein 1) the groove is disposed in the exterior of the head, 2) the helical portion of the groove is open at one end adjacent the shoulder of the plug and communicates with the transverse portion of the groove, 3) the transverse portion of the groove has one end in communication with the helical portion of the groove and an end wall at an opposite end, and 4) wherein the locator comprises an inwardly extending guide that rides in the groove such that i) when the guide rides in the transverse portion of the groove the plug can be rotated relative to the cup without axially displacing relative to the cup, and ii) when the guide rides in

the helical portion of the groove rotation of the plug axially displaces the plug relative to the cup permitting the plug to be removed from the cup.

37. The insert of claim 35 wherein the shoulder of the plug has a plurality of spaced apart notches and the receiver has a detent that extends inwardly into the cavity and the detent cooperates with at least one of the notches to permit the plug to be selectively rotated.

38. The insert of claim 37 wherein the detent is disposed adjacent the shoulder of the cavity.

39. The insert of claim 38 wherein the detent comprises a ball resiliently biased toward the cavity such that a portion of the ball is disposed in the cavity.

40. The insert of claim 24 wherein the receiver comprises a cup that is removably attached to the mold by a fastener.

41. The insert of claim 24 wherein the receiver comprises a cup and the cup and plug are carried by an ejector pin that operably cooperates with the mold.

42. The insert of claim 41 wherein the cup is removably attached to the ejector pin by a fastener.

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43. The insert of claim 24 wherein the receiver comprises a cup and the plug and cup are received in a pocket in a cavity in the mold and the axially outer face of the plug comprises an indicia imprinting surface for imparting an impression in a hardenable material received in the mold cavity.

44. The insert of claim 43 wherein the hardenable material comprises plastic.

45. The insert of claim 43 wherein the hardenable material comprises a metal.

46. The insert of claim 24 wherein 1) the mold has a cavity therein for receiving a hardenable material therein from a source of the hardenable material, 2) the receiver comprises a cup that is received in a pocket in the mold, 3) the axially outer face of the plug has a channel therein, and 4) wherein the plug i) is rotated to an open position to permit flow of the hardenable material from the source through the channel to the cavity in the mold, and ii) is rotated to a closed position disposed from the open position to impede flow of the hardenable material from the source through the channel and to the cavity in the mold.

47. The insert of claim 1 wherein the insert is carried by an ejector pin comprised of round bar stock having a barrel that is hardened and a larger diameter portion that is cut to length and machined to form a head that has a larger diameter than the barrel.

48. An insert assembly for a mold comprising:

a first plug having an outer axial face and a cavity in the outer axial face;

a receiver having a cavity therein for receiving the plug;

a first rotating mechanism that operably cooperates with the first plug and the receiver to permit the first plug to be rotated relative to the mold;

a second plug received in the cavity in the first plug and having an outer axial face; and

a second rotating mechanism that operably cooperates with the second plug and the first plug to permit the second plug to be rotated relative to the first plug.

49. An insert for a mold comprising:

a plug having a head with an axially outer face, a generally cylindrical body that is diametrically smaller than the head and which has a groove therein, and a shoulder formed where the head and body adjoin;

a receiver having a cavity therein for receiving the plug with the cavity defined by a sidewall and having a radial shoulder, a first portion for receiving the head of the plug, a second portion that is diametrically smaller than the first portion for receiving the body of the plug, and a locator carried by the sidewall that is received in the groove when the plug is received in the cavity; and

a detent assembly carried by one of the shoulders for cooperating with the other of the shoulders to permit the plug to be selectively indexed.

50. An insert for a mold comprising:

a plug having a head with an axially outer face, a generally cylindrical body that is diametrically smaller than the head and which carries a locator resiliently biased radially outwardly therefrom, and a shoulder formed where the head and body adjoin;

a receiver having a cavity therein for receiving the plug with the cavity defined by a sidewall and having a radial shoulder, a first portion for receiving the head of the plug, a second portion that is diametrically smaller than the first portion for receiving the body of the plug, and a groove in the sidewall that receives the locator of the plug when the plug is received in the cavity; and

a detent assembly carried by the receiver for cooperating with the plug to permit the plug to be selectively indexed.

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